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(81) Designated States (national): AE, AG, AL, AM, AT, AU,
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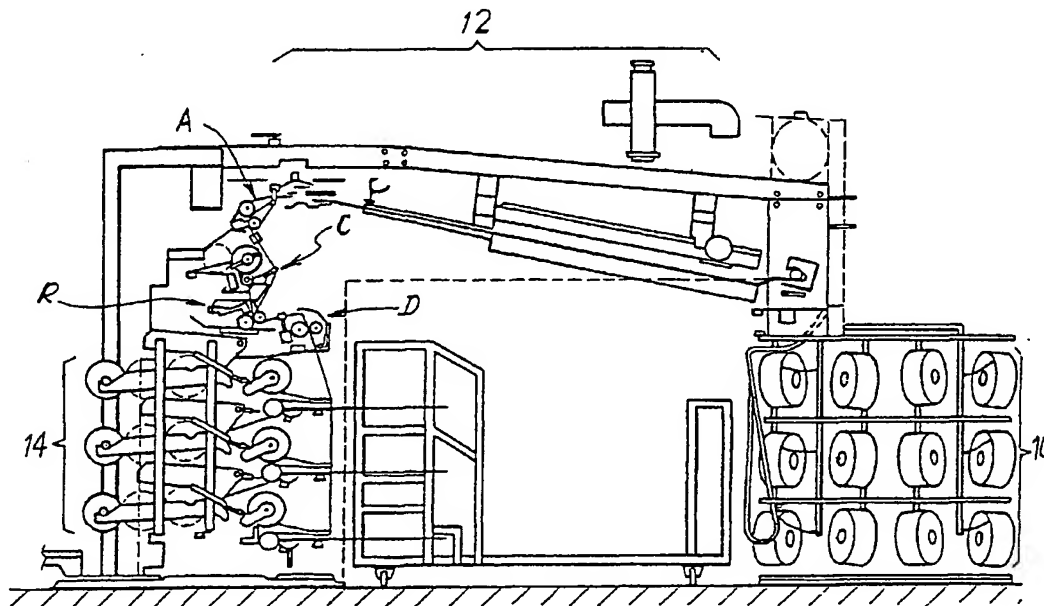
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TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
GW, ML, MR, NE, SN, TD, TG).

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[Continued on next page]

(54) Title: TEXTURING AND INTERLACING MACHINE



(57) Abstract: The machine comprises a texturing zone (12) through which said covering yarn (22) advances; a feed unit (C) for the elastomer yarn (20); combining means to combine the textured covering yarn (22) with the elastomer yarn (20), said means comprising a first roller (B) to which said textured covering yarn (22) and said elastomer yarn (20) are fed; downstream of said first roller (B) an interlacing device (23) to interlace said textured covering yarn (22) and said elastomer yarn (20). Moreover, a drawing roller (A) for the textured covering yarn (22) is also provided between the texturing zone (12) and said first roller (B) of the combining means.

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"TEXTURING AND INTERLACING MACHINE"
DESCRIPTION

Technical field

The present invention relates to a machine for texturing yarns,
5 composed as known in the art of a feed section (creel), a texturing treatment section, and a section to take up the textured yarn (collection).

Prior art

The system known in the art combines, downstream of these machines, one or more textured yarns with an elastomer yarn, generally
10 Lycra™, which is pre-stretched to impart greater elasticity to the combined yarns. The textured yarn forms a covering or coating around the elastomer yarn. Combination is performed with specific interlacing devices, generally air interlacing devices. An example of air interlacing is described in US-A-3940917.

15 This process is also integrated with texturing machines to obtain, in a single cycle, the functions of texturing and interlacing. Combined devices to perform in-line texturing of the covering yarn and subsequent combination with the elastomer yarn are described in US-A-6,393,817 and US-A-5,008,992. Nonetheless, there are some drawbacks in known embodiments of
20 this type. Firstly, the feed unit for the elastomer yarn is situated in a distant position from the texturing machine, and is thus inconvenient for the operator.

Moreover, the elastomer and textured yarns are fed directly to the interlacing zone. In US-A-5,008,992 the textured yarn is fed directly into a nip between two feed rollers, into which the elastomer yarn is also fed, coming
25 directly from an unwinder of a package of elastomer. The two yarns are delivered directly from the feed rollers to the interlacing jet.

Objects and summary of the invention

The object of the present invention is the production of a combined machine, for the texturing of a covering or coating yarn and for interlacing this
30 yarn with an elastomer yarn, which overcomes the drawbacks of machines known in the art.

This and other objects and advantages, which shall appear clear to those skilled in the art from reading the text hereinafter, are attained with a

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machine comprising: a texturing zone through which a covering yarn advances; a feed unit for an elastomer yarn; combining means to combine the textured covering yarn with the elastomer yarn, which comprise a first roller to which the textured covering yarn and the elastomer yarn are fed; downstream
5 of the first roller an interlacing device for interlacing said textured covering yarn and said elastomer yarn. Characteristically, according to the invention, a drawing roller of the textured covering yarn is disposed between the texturing zone and the first roller of combining means.

Advantageously, the speed ratio between the first roller of the
10 combining means, the drawing roller and/or the feed unit of the elastomer yarn may be variable.

Further advantageous characteristics and embodiments of the invention are indicated in the appended claims.

The invention makes it possible to attain overfeed ratios (possibly also
15 stretch to encourage better return) of the textured yarn and of stretch of the elastomer yarn before they enter the interlacing phase, to allow this phase to be performed in the most advantageous conditions.

This produces an excellent quality of resulting yarn and possibly also a reduction in air consumption in the interlacing device.

20 The position of the feed device of the elastomer yarn immediately downstream of the drawing roller of the textured yarn is ideal to facilitate threading, that is to say initial introduction of the yarn into the machine.

Brief description of the drawings

The invention shall now be described with reference to the appended
25 drawings in which:

Fig. 1 shows a texturing machine according to the invention;

Fig. 2 is an illustration, enlarged in relation to Fig. 1, of the part of the texturing machine dedicated to combining and interlacing the textured yarn with the elastomer yarn.

30 Detailed description of the preferred embodiment

With reference firstly to Fig. 1, the machine illustrated comprises, as known in the art, a feed zone 10 for the covering yarn 22 to be textured, a texturing zone 12, which terminates with a roller A to pick up the textured yarn

22. The roller A cooperates with a counter pressure roller A1. Downstream of the roller A, in a position immediately adjacent to it, is a unit C to feed elastomer yarn 20, for example Lycra® (see Fig. 2) which sends this elastomer yarn 20 to another additional roller B which forms part of combining means of the yarns 20 and 22 and to which the textured covering yarn 22 coming from the roller A is simultaneously fed. The roller B cooperates with a counter pressure roller B1.

The ratio between the speed of rotation of the rollers A and B may be established as desired so as to allocate the textured covering yarn 22 a stretch or an overfeed chosen at will by the operator to obtain the most favourable conditions. Naturally, it is also possible to obtain a circumferential speed ratio of the rollers A and B of 1, with simple transfer of the yarn.

Likewise, the stretch ratio between the roller B and the delivery roller of the feed unit C may be chosen at will, to impart the desired stretch to the elastomer yarn 20, which may differ from the stretch of the textured covering yarn 22.

In this way, the two yarns, textured 22 and elastomer 20, are sent to the interlacing device 23 without being subjected to, in this device, stresses of any nature and in particular stretch or overfeed stresses differing from each other. This produces a better quality in the resulting yarn and possibly also a reduction in air consumption in the interlacing device 23.

Positioned at the outlet of the interlacing device 23 is a pick up roller D for the composite yarn, formed by interlacing the yarns 20 and 22. The roller D cooperates with a counter pressure roller D1. The roller D is preferably operated at the most appropriate speed of the roller B (generally overfeed), in order to obtain the best interlacing conditions.

Downstream of the roller D (Fig.1) the composite yarn is collected in a section 14 of the machine, according to conventional methods.

It is understood that the drawing only shows one embodiment provided purely as a practical illustration of the invention, as the invention may vary in form and layout without departing from the scope of the concept which forms the invention. The presence of any reference numerals in the appended claims is intended to facilitate reading of the claims with reference to the

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description and the drawing, and does not limit the scope of protection represented by the claims.

CLAIMS

1. Machine for texturing a covering yarn (22) and interlacing said textured covering yarn (22) with an elastomer yarn (20), comprising:
- a texturing zone (12) through which said covering yarn (22) advances;
 - 5 - a feed unit (C) for the elastomer yarn (20);
 - combining means to combine the textured covering yarn (22) with the elastomer yarn (20), said means comprising a first roller (B) to which said textured covering yarn (22) and said elastomer yarn (20) are fed;
 - downstream of said first roller (B) an interlacing device (23) to interlace
 - 10 said textured covering yarn (22) and said elastomer yarn (20);
- characterized by a drawing roller (A) for the textured covering yarn (22) disposed between the texturing zone (12) and said first roller (B) of the combining means.
2. Machine as claimed in claim 1, characterized in that the ratio
- 15 between the rotation speed of the first roller (B) of the combining means and the rotation speed of the drawing roller (A) is variable.
3. Machine as claimed in claim 1 or 2, characterized in that the rotation speed of the first roller (B) of the combining means can be regulated to vary at will the ratio of the speeds in relation to the drawing roller (A) of the
- 20 textured covering yarn (22).
4. Machine as claimed in claim 1, 2 or 3, characterized in that the ratio of the rotation speeds of the first roller (B) of the combining means and of the feed unit (C) of the elastomer yarn (20) can be regulated to obtain the desired stretch ratio of the elastomer yarn prior to interlacing.
- 25 5. Machine as claimed in one or more of the previous claims, characterized in that positioned downstream of the interlacing device is a delivery roller (D) and in that the ratio between the speeds of the first roller of the combining means and the delivery roller (D) can be regulated.
6. Machine as claimed in claim 5, characterized in that the speed
- 30 of the first roller (B) of the combining means is greater than the speed of the delivery roller (D) to obtain an overfeed.
7. Machine as claimed in one or more of the previous claims, characterized in that the feed unit (C) of the elastomer yarn is disposed

immediately adjacent to and downstream of the drawing roller (A) of the textured covering yarn (22), in an intermediate position between said drawing roller and said first roller (B) of the combining means.

8. Machine as claimed in one or more of the previous claims,
5 characterized in that disposed along the path of the textured covering yarn (22), between said drawing roller (A) and said first roller (B) of the combining means, is an oven (25) for heating and stabilizing the textured covering yarn.

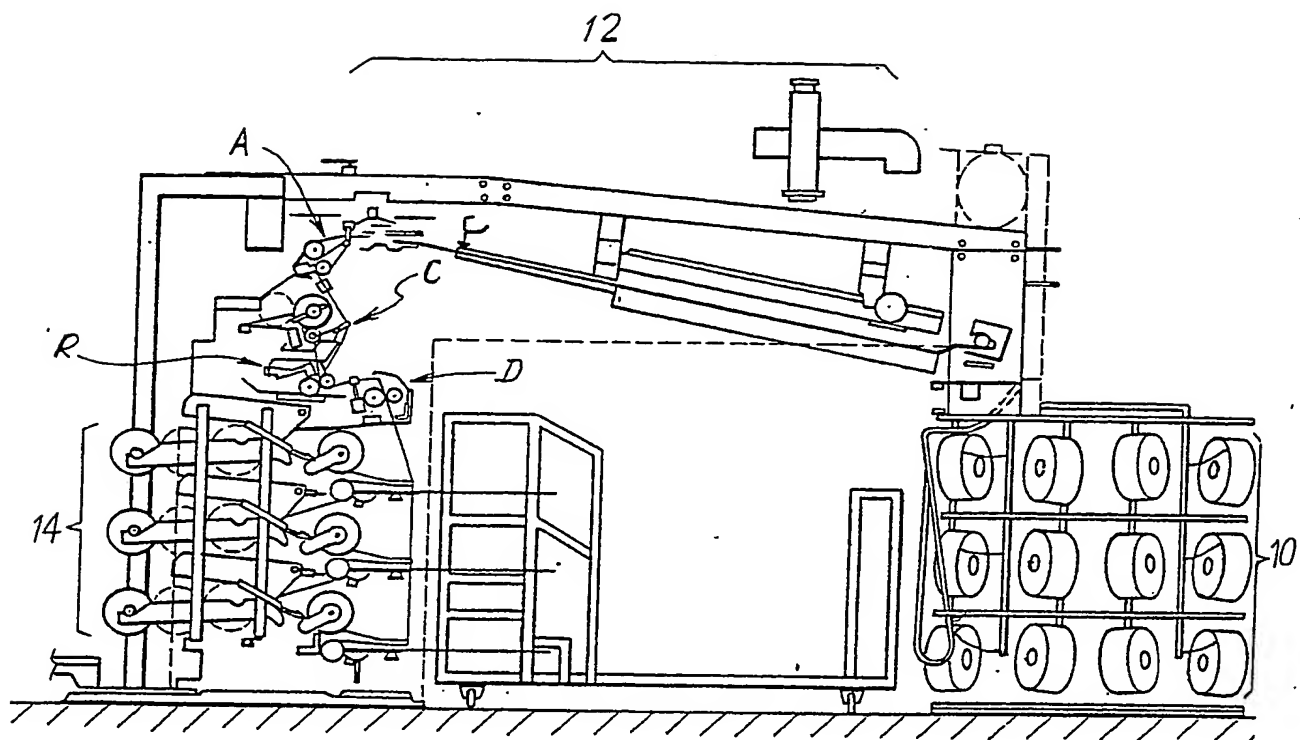


Fig.1

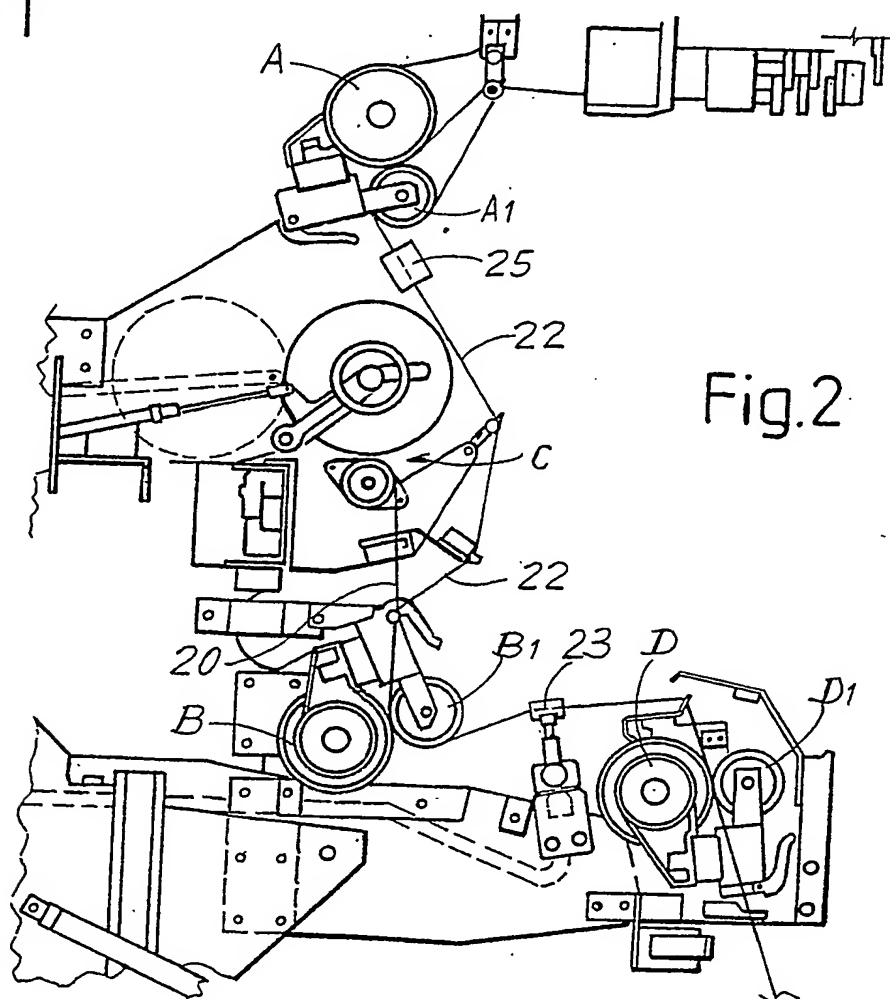


Fig.2

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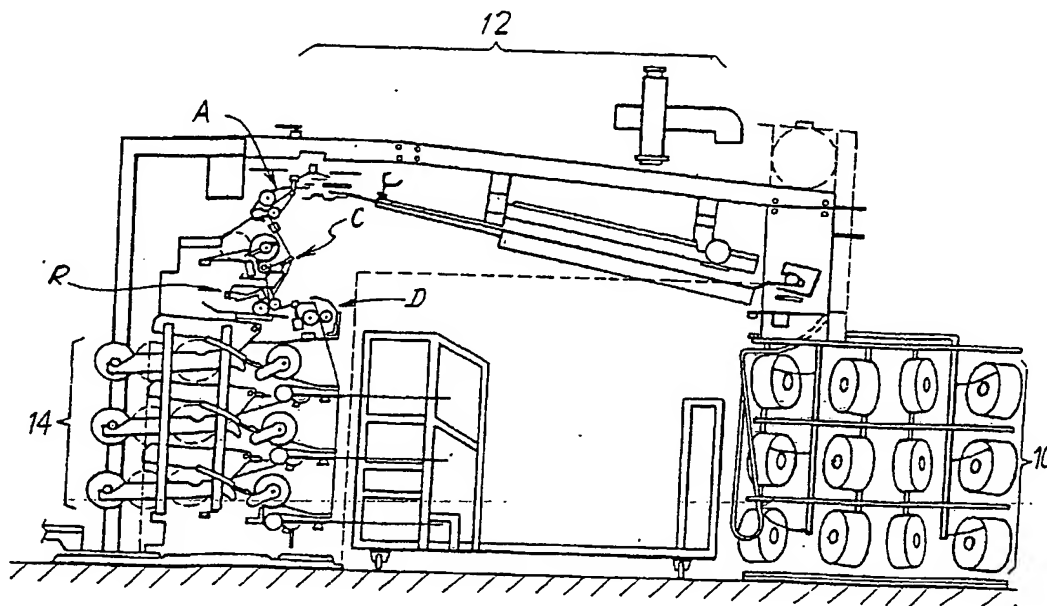
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- (21) International Application Number: PCT/IT02/00706 (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.
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- (71) Applicant (*for all designated States except US*): GIUDICI S.p.A. [IT/IT]; Via San Galdino 6, I-23856 Sala Al Barro, Lecco (IT).
- (72) Inventor; and
- (75) Inventor/Applicant (*for US only*): GIUDICI, Domenico [IT/IT]; Fraz. Camporeso 7, I-23851 Galbiate, Lecco (IT).
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(54) Title: EXTURING AND INTERLACING MACHINE



(57) Abstract: The machine comprises a texturing zone (12) through which said covering yarn (22) advances; a feed unit (C) for the elastomer yarn (20); combining means to combine the textured covering yarn (22) with the elastomer yarn (20), said means comprising a first roller (B) to which said textured covering yarn (22) and said elastomer yarn (20) are fed; downstream of said first roller (B) an interlacing device (23) to interlace said textured covering yarn (22) and said elastomer yarn (20). Moreover, a drawing roller (A) for the textured covering yarn (22) is also provided between the texturing zone (12) and said first roller (B) of the combining means.

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 994 205 A (FADIS SPA) 19 April 2000 (2000-04-19) cited in the application the whole document ---	1
A	US 5 008 992 A (GEHRMANN BERND ET AL) 23 April 1991 (1991-04-23) cited in the application the whole document ---	1
A	FR 2 749 859 A (ICBT VALENCE) 19 December 1997 (1997-12-19) the whole document ---	1
A	US 4 829 757 A (CANTON ARMANDO) 16 May 1989 (1989-05-16) column 3, line 12-62 ---	1
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Patent family members are listed in annex.

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- *E* earlier document but published on or after the International filing date
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Y document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

& document member of the same patent family

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Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 D02G D02J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

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A	US 4 829 757 A (CANTON ARMANDO) 16 May 1989 (1989-05-16) column 3, line 12-62 ---	1
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Name and mailing address of the ISA

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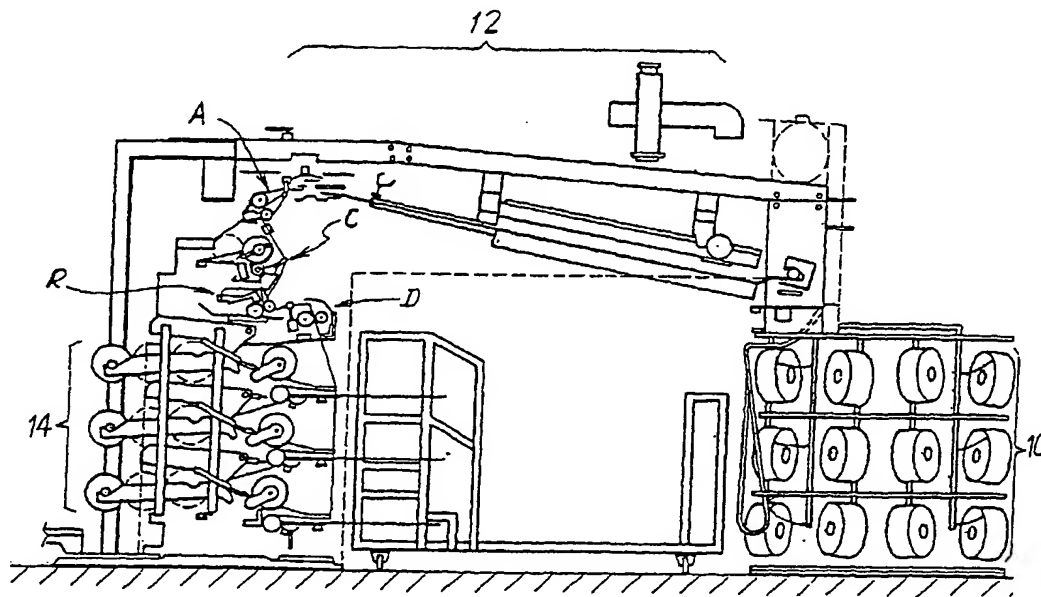
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